

TYPHOON DAVID (21W)

The disturbance which would become Typhoon David (21W) was first noted in the monsoon trough northeast of Kwajalein on 09 September. Visible satellite imagery on 10 September showed Super Typhoon Oliwa (02C), moving northwestward south of the subtropical ridge axis. Southeast of Oliwa, the monsoon trough extended from 155E to 175W along the 10N latitude line in conjunction with a weaker near-equatorial trough in the southern hemisphere that extended from 160E to 173E near 5S to 8S. The twin troughs were indicative of a large area of westerly winds straddling the equator between 10N and 8S. The system was initially mentioned on the Significant Tropical Weather Advisory (ABPW) at 0600 on 10 September; six hours later a Tropical Cyclone Formation Alert (TCFA) was issued. By 12 September at 0034Z, visible satellite imagery indicated that the developing depression had a very large associated low-level circulation, with westerly winds feeding into the vortex from as far west as 150E. On the eastern side, flow into the vortex extended well past the dateline. At 1800Z that day, JTWC issued the first warning on the system. Post-analysis would later indicate that the system had actually reached tropical depression intensity (25 kt(13 m/sec)) two days earlier on 10 September. The system continued to organize as it tracked northwestward at approximately 10 kt (19 km/hr).

David intensified at a climatological rate, becoming a typhoon by 1800Z on 13 September. The cyclone tracked steadily in a northwestward direction equatorward of the sub-tropical ridge (Standard Dominant Ridge pattern/region of the Systematic and Integrated Approach – see Chapter 1). David's large size contributed to the strong northwestward component of its motion due to the "Beta Effect". This is the mechanism by which large tropical cyclones tend to self-propagate northward due to their disturbance of the earth's vorticity field.

By 1800Z on 14 September, David had reached its peak of 95 kt (49 m/sec), remaining at this intensity for 36 hours. It continued traveling in a generally northwestward direction at speeds ranging from 12 - 15 kt (22 - 28 km/hr). By 16 September, strong mid-level ridging (related to the large Beta Effect) had developed east of the system. This was indicative of the formation of a Poleward/Poleward Oriented pattern/region (Systematic and Integrated Approach, see Chapter 1). Transition to the poleward pattern, along with a passing mid-latitude trough, caused David to recurve.

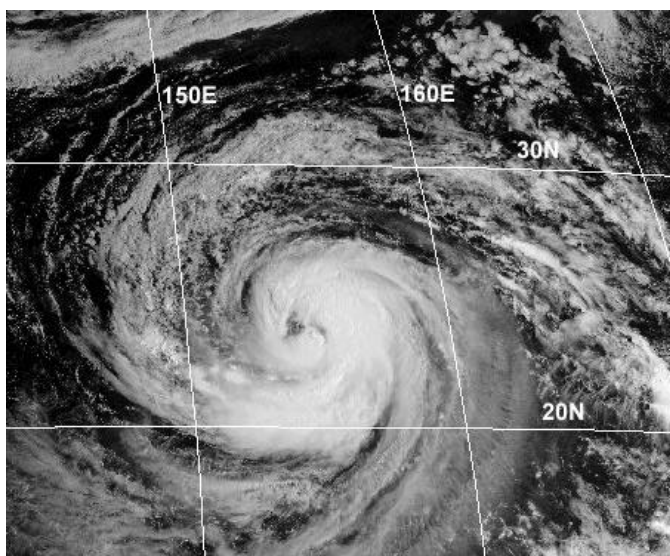


Figure 3-21-1 Typhoon David (21W) at 2230Z on 15 September 1997.

David passed near the island of Minami Tori Shima (WMO 479910) on the 16th, where sustained winds of 65 kt (33 m/sec) and a minimum sea level pressure of 968mb were recorded. Deep convection started to decrease near the system center as the cyclone began to weaken. However, the convection around the periphery began to increase and visible satellite imagery indicated a large cloud free area around the tropical cyclone's center.

At 0000Z on the 18th, David made its closest approach to the island of Chi Chi Jima (WMO 47971), where sustained wind speeds of 40 kt (21 m/sec) and a minimum sea level pressure of 967mb were reported. The intensity had dropped to 65 kt (33 m/sec), but the system remained a threat to the islands of Japan. Fortunately, David continued to turn toward the northeast, making its closest approach to Honshu on 19 September. Yokosuka reported 30 kt (15 m/sec) sustained winds at 0300Z.

JTWC issued its final warning at 0600Z on 20 September as the system transitioned to an extratropical low. The remnants of Typhoon David (21W) continued moving into the Gulf Of Alaska. There were no reports of damage or injuries as a result of David.

